



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,190	06/27/2003	Tajul Arosh Baroky	70030981-1	7614

7590 02/09/2005
AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER	
ROY, SIKHA	
ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/609,190

Applicant(s)

BAROKY ET AL.

Examiner

Sikha Roy

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

Page 5, line 5 'a optical resonator,' should be replaced with --an optical resonator--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 12, 15, 16, 19-23, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,252,254 to Soules et al.

Regarding claim 1 Soules discloses (column 2 lines 1-32) a light emitting device comprising a laser diode and a phosphor composition positioned to receive light (blue light) from the laser diode and capable of absorbing the light and emitting light (red) at a wavelength longer than that (blue) emitted from the laser diode.

Regarding claim 2 Soules (column 2 lines 26,27) the light emitting device (phosphor composition and the light source together) producing white light.

Regarding claim 3 Soules discloses (column 4 lines 10-24) the phosphor composition comprising first type of phosphor particles emitting red light and second

Art Unit: 2879

type of phosphor particles emitting green light upon excitation from the blue-emitting LED.

Referring to claim 4 Soules discloses the first type (red color emitting phosphor) emits light having wavelength in the range of 600-630 nm.

Regarding claim 5 Soules discloses (column 4 lines 29-31) the first type (red-emitting phosphors) of phosphor particles comprising SrS:Eu^{2+} .

Regarding claim 6 Soules discloses the second type of phosphors (column 4 lines 11-13) emits green light having wavelength in the range of 510-560 nm.

Regarding claim 7 Soules discloses the second type of phosphor particles comprising $\text{Sr}(\text{Ga})_2\text{S}_4\text{:Eu}^{2+}$.

Regarding claim 8 Soules discloses the first type (red color emitting phosphor) emits light having wavelength in the range of 600-630 nm.

Regarding claim 9 Soules discloses phosphor composition emitting yellow light.

Regarding claims 10 and 11 Soules discloses (column 5 lines 53-65) the yellow phosphor emitting light in the wavelength range of 570-590 nm and comprising $\text{Y}_3\text{Al}_5\text{O}_{12}\text{:Ce}^{3+}$.

Regarding claim 12 Soules discloses (Fig. 2 column 6 lines 15-21) the phosphor composition is a conformal coating (layer) 15 disposed on the surface of the laser diode.

Regarding claim 15 Soules discloses (column 6 lines 15-27 Fig. 2) phosphor composition comprising clear polymer (such as polycarbonate) having phosphor particles suspended therein and the clear polymer matrix 15 is shaped as a lens,

Art Unit: 2879

positioned to receive light from the laser diode and to direct light from the light emitting device.

Regarding claim 16 Soules discloses (column 5 lines 61-65) the phosphor composition comprising SrS:Eu^{2+} .

Claim 19 essentially recites the same limitations as of claim 7 and hence is rejected for the same reason.

Regarding claim 20 Soules discloses (column 2 lines 1-9) the light emitting device comprising phosphor composition with $\text{Y}_3\text{Al}_5\text{O}_{12}:\text{Ce}^{3+}$.

Regarding claim 21 Soules discloses (column 5 lines 56,57) the phosphor composition (red color-emitting phosphor) has an emission peak in the wavelength range of 600-650nm.

Regarding claim 22 Soules discloses the phosphor composition (green color-emitting phosphor) has an emission peak in the wavelength range of 530-555nm.

Regarding claim 23 Soules discloses (column 5 lines 52-56) the phosphor composition has an emission peak in the wavelength range of 570-590nm.

Referring to claim 25 Soules discloses (column 2 lines 112, claim 2) the light emitting device is a blue emitting laser diode.

Claims 1,2, 13,14, 25 - 27 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,294,800 to Duggal et al.

Regarding claim 1 Duggal discloses (column 3 lines 45-62, column 4 lines 54-67) a lamp comprising laser diode and a phosphor composition positioned to receive

Art Unit: 2879

ultraviolet light (254 nm) emitted from the laser diode and absorbing the light and converting the light into a longer wavelength in visible range.

Regarding claim 2 Duggal discloses (column 5 lines 34-36) the device generates bright white light.

Regarding claim 13 Duggal discloses (column 7 lines 48-50) the coating of phosphor layer having thickness of about 16-30 micrometers.

Regarding claim 14 it is clearly evident from Fig. 6 of Duggal that phosphor composition 250 is disposed on the surface of a lens 230 to receive light from the laser diode 210.

Regarding claims 25,26 and 27 Duggal discloses (column 5 lines 3-11) the laser diode can be a blue or violet (radiation with wavelength between 330-420 nm) or UV laser diode (radiation with wavelength between 365-375 nm).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,252,254 to Soules and further in view of U.S. Patent 6,391,504 to Tai et al.

Regarding claim 17 Soules does not exemplify phosphor composition comprising a material selected from CaS: Eu²⁺, Mn²⁺ and (Zn,Cd)S: Ag²⁺.

Tai in relevant art of phosphors for field emission display panel discloses (column 5 lines 33-37) phosphor which emits red light is (Zn,Cd)S:Ag.

The selection of known material for a known purpose is generally considered to be within the skill of the art. It would have been obvious to use (Zn,Cd)S:Ag for red emitting phosphor as suggested by Tai et al. in the phosphor composition of Soules because the selection of known material for known purpose is within the skill of the art.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,252,254 to Soules and further in view of U.S. Patent 6,654,079 to Bechtel et al.

Regarding claim 18 Soules does not exemplify the light emitting device having the phosphor composition comprising a material selected from $\text{Mg}_4\text{GeO}_{5.5}\text{F}:\text{Mn}^{4+}$.

Bechtel in pertinent art of phosphor layer for color display discloses (column 2 line 65 through column 3 line 4) red phosphor composition comprising $\text{Mg}_4\text{GeO}_{5.5}\text{F}:\text{Mn}^{4+}$. Bechtel further discloses the luminous intensity in the red range and the resultant optical efficiency achieved by means of this phosphor is very high.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include $\text{Mg}_4\text{GeO}_{5.5}\text{F}:\text{Mn}^{4+}$ in the phosphor composition of Soules as suggested by Bechtel for providing high luminous intensity and optical efficiency of the light emitting device.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,252,254 to Soules and further in view of U.S. Patent Application Publication 200/0188697 to Brunner et al.

Regarding claim 24 Soules discloses (column 4 lines 23,24) the phosphor particles have preferred size of 2-5 micrometer. Soules fails to disclose phosphor particles having mean particle diameter in the range of 13 to 20 micrometer.

Brunner in same field of endeavor discloses ([0093]) the phosphor particle having a mean particle diameter between 2 and 20 micrometer is preferred. Brunner further explains that decreasing particle diameter the scattering of radiation at the particles increases and the conversion efficiency decreases and hence phosphors with preferred mean particle diameter between 2 and 20 micrometer provides less scattering and more efficient conversion of radiation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to select the phosphor particle having mean particle diameter preferably between 2 and 20 micrometer as suggested by Brunner in the phosphor composition of Soules for providing less scattering and more efficient conversion of radiation.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,252,254 to Soules and further in view of U.S. Patent 6,490,309 to Okazaki et al.

Claim 28 differs from Soules in that Soules does not exemplify the laser diode operated in pulse mode.

Okazaki in relevant field of laser diode discloses (column 10 lines 19-29) laser diode operated in pulse mode. Okazaki further discloses that high pulsed ultraviolet light can be obtained with high efficiency and high output power by driving the laser diode in a pulse mode.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to operate the laser diode of Soules in a pulse mode as suggested by Okazaki so that high pulsed ultraviolet light can be obtained with high efficiency and high output power.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,084,250 to Justel et al. , U.S. Patent 6,255,670 to Srivastava et al. and U.S. Patent 6,686,691 to Mueller et al. disclose white emitting diode using different phosphor compositions. U.S. Patent 6,614,824 to Tsuda et al. discloses violet wavelength between 380-420 nm.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (703) 308-7382.

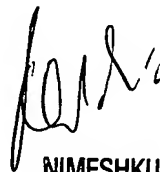
Art Unit: 2879

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sikha Roy
Patent Examiner
Art Unit 2879



NIMESHKUMAR D. PATEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800